Changing the Game

Visualization Tool for Examining the
Evolution of Play and Players Throughout
NBA History

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Agenda

- Problem Statement & Targeted Audience
- Dashboard Demo
- Building Blocks and Design Choices
- Questions/Feedback

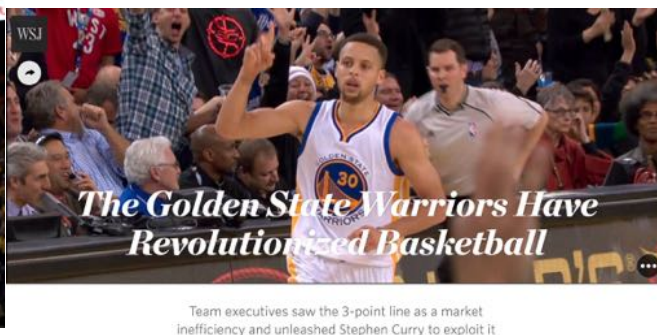# Problem Statement & Targeted Audience

A Game of Eras

When you think of basketball, what comes to your mind?

- 7 feet tall centers?
- High flying dunks?
- Fancy dribbling?
- Step back 3 pointers?
- Bird and Magic?
- Michael Jordan?
- Lebron James?

Interest is at an all time high

https://goo.gl/D1AN4L

https://goo.gl/TQ4jAp

https://goo.gl/W2MxJ5

Our Shot

We want to use dynamic visualizations to show:

- Large trend changes in the NBA

- How the style of play has evolved over time

- How rule changes have impacted the game

Target Audience

Our target audience is anyone curious about the game of basketball. Whether you are a

- NBA Fan
- NBA Player
- Sports Journalist
- NBA Hater

Our visualization will help provide historical context to how NBA basketball has been played over time.

Dataset

Hollinger Stats - Player Efficiency Rating - Qualified Players

RK	PLAYER	GP	MPG	TS%	AST	TO	USG	ORR	DRR	REBR	PER	VA	EWA
1	James Harden, HOU	72	35.4	.619	23.2	11.6	35.9	1.8	15.2	8.6	29.87	718.5	23.9
2	Anthony Davis, NO	75	36.4	.612	8.4	7.9	27.7	7.7	24.8	16.5	28.98	711.4	23.7
3	LeBron James, CLE	82	36.9	.621	25.7	11.9	31.7	3.7	22.3	13.1	28.65	819.5	27.3
4	Stephen Curry, GS	51	32.0	.675	21.2	10.5	30.0	2.7	14.4	9.0	28.32	421.7	14.1
5	Giannis Antetokounmpo, MIL	75	36.7	.598	15.9	9.8	29.8	6.7	25.3	16.0	27.37	652.7	21.8
6	Kevin Durant, GS	68	34.2	.640	18.6	10.5	29.1	1.6	19.5	11.2	26.05	539.7	18.0
7	Damian Lillard, POR	73	36.6	.594	20.6	8.8	30.5	2.6	10.6	6.6	25.19	565.4	18.8
8	LaMarcus Aldridge, SA	75	33.5	.570	8.5	6.2	27.5	10.8	17.3	14.0	25.12	510.2	17.0
9	Kyrie Irving, BOS	60	32.2	.610	18.6	8.5	30.3	1.9	10.8	6.4	25.03	404.4	13.5
10	Karl-Anthony Towns, MIN	82	35.6	.646	11.7	9.3	21.9	9.3	30.9	20.0	24.99	626.6	20.9
RK	PLAYER	GP	MPG	TS%	AST	TO	USG	ORR	DRR	REBR	PER	VA	EWA
11	Russell Westbrook, OKC	80	36.4	.524	26.1	12.1	35.7	5.6	25.7	15.3	24.80	600.0	20.0
12	Montrezl Harrell, LAC	76	17.0	.647	9.4	8.6	22.5	8.9	17.0	13.0	24.73	255.4	8.5
13	Clint Capela, HOU	74	27.5	.650	7.1	10.7	18.0	13.5	30.8	22.2	24.55	423.6	14.1
14	Nikola Jokic, DEN	75	32.5	.603	25.2	11.6	24.9	9.0	27.9	18.5	24.52	507.0	16.9
15	Chris Paul, HOU	58	31.8	.604	30.9	8.6	25.4	2.3	16.7	9.5	24.39	369.2	12.3
16	Hassan Whiteside, MIA	54	25.3	.573	6.7	11.4	22.9	14.3	36.6	25.4	24.18	276.5	9.2

- Player-level season statistics
  - Created team-level statistics
- Data Range 1976-2017
  - Cut from 1950s to account for the league mergers
- Player attributes
  - Birth place
  - Height

Dashboard Demo

Building Blocks and Design Choices

Building Blocks

Our dashboard revolves around the slider, which:

- Highlights the centrality of the time dimension in our analysis
- Makes the dashboard interactive

We decided to include 4 plots that would demonstrate how the league has evolved in both style of play and player composition:

- 3 point shots attempted and made
- Pace
- Physical evolution of players
- Internationalization of the league

For years when something noteworthy happened, we decided to include an infographic, to complement the information presented in the plots

Plots – Marks & Channels

Marks:

- Circles
  - All plots
- Line, Area
  - 3 point shooting

Gestalt Principles

- Similarity
  - Pace Plot - circles form 3 distinct lines of different colors
- Proximity
  - Height Plot - clusters of circles are same position
  - Birth Place Map - clustered circles are many players from same region

Channels:

- Position
  - All plots
- Color hue
  - Pace - max/mean/min
- Area
  - 3 point shooting - area under curve for made shots
  - Height - area codes number of players in bin
- Motion
  - All with slider movement
- Opacity
  - 3 pt, Pace - opacity indicates current year

Design Choices

Color Scheme: The dashboard only features 3 colors (red, white and blue), the colors of the NBA logo.

Black background makes our visualizations look crisper and the space look less cluttered.

Layout: All visualizations are placed on a single HTML page to maximize the dashboard feeling and allow for the analysis of the evolution over time of multiple statistics

Feasibility trade-offs: we designed the best looking dashboard that we felt we could realize in D3

Design trade-offs: plots competing for space - results in other smaller decisions

Rotated axis labels, scales on Pace & Height plot (also relative vs. absolute measure trade-off)

Questions?